

AN INTEGRATED EXTRAVEHICULAR ACTIVITY RESEARCH PLAN

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Multiple organizations within NASA and outside of NASA fund and participate in research related to extravehicular activity (EVA). In October 2015, representatives of the EVA Office, the Crew and Thermal Systems Division (CTSD), and the Human Research Program (HRP) at NASA Johnson Space Center agreed on a formal framework to improve multi-year coordination and collaboration in EVA research. At the core of the framework is an Integrated EVA Research Plan and a process by which it will be annually reviewed and updated.

The over-arching objective of the collaborative framework is to conduct multi-disciplinary cost-effective research that will enable humans to perform EVAs safely, effectively, comfortably, and efficiently, as needed to enable and enhance human space exploration missions. Research activities must be defined, prioritized, planned and executed to comprehensively address the right questions, avoid duplication, leverage other complementary activities where possible, and ultimately provide actionable evidence-based results in time to inform subsequent tests, developments and/or research activities.

Representation of all appropriate stakeholders in the definition, prioritization, planning and execution of research activities is essential to accomplishing the over-arching objective. A formal review of the Integrated EVA Research Plan will be conducted annually. External peer review of all HRP EVA research activities including compilation and review of published literature in the EVA Evidence Book is already performed annually. Coordination with stakeholders outside of the EVA Office, CTSD, and HRP is already in effect on a study-by-study basis; closer coordination on multi-year planning with other EVA stakeholders including academia is being actively pursued.

Details of the current Integrated EVA Research Plan are presented including description of ongoing and planned research activities in the areas of: Benchmarking; Anthropometry and Suit Fit; Sensors; Human-Suit Modeling; Suit Trauma Monitoring and Countermeasures; EVA Workload and Duration Effects; Decompression Sickness Risk Mitigation; Deconditioned EVA Performance; and Exploration EVA Concept of Operations.

Session:

CES401: ASME/AIAA LS&S

Extravehicular Activity: Systems

This session includes topics describing aspects of EVA systems, technologies, and studies that envision the space suit as a system. Concepts and testing of advanced space suit systems are also included.

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